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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,340	01/23/2007	Michael Anthony Wood	KPT 1100	4895

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SENNIGER POWERS
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

PUTTLITZ, KARL J

ART UNIT	PAPER NUMBER
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1621

NOTIFICATION DATE	DELIVERY MODE
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11/20/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary

Application No.

10/577,340

Applicant(s)

WOOD ET AL.

Examiner

Karl J. Puttlitz

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1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/10/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,077,442 to Hara et al. (Hara).

The rejected claims cover, inter alia, a homogeneous process for the hydrogenation of dicarboxylic acids and/or anhydrides in the presence of a catalyst comprising: (a) ruthenium, rhodium, iron, osmium or palladium; and (b) an organic phosphine; wherein the hydrogenation is carried out in the presence of at least about 1% by weight water and wherein the reaction is carried out at a pressure of from about 500 psig to about 2000 psig and a temperature of from about 200 C to about 300 C such that from about 1 mol to about 10 mol of hydrogen are used to strip 1 mole of product from the reactor.

With regard to the above embodiments, Hara teaches method for producing 1,4-butanediol by hydrogenating succinic anhydride, succinic acid or γ -butyrolactone in the presence of a catalyst, wherein the hydrogenation reaction is conducted in a liquid phase using as the catalyst a ruthenium type catalyst comprising ruthenium, an organic phosphine and a phosphorus compound, see column 1, lines 52+.

The organic phosphine is considered to contribute to the control of the electron state of ruthenium as the main catalyst or to the stabilization of the active state of ruthenium. Specific examples of such an organic phosphine include a trialkylphosphine such as tri-n-octylphosphine, tri-n-butylphosphine or dimethyl-n-octylphosphine, a tricycloalkylphosphine such as tricyclohexylphosphine, a triarylphosphine such as triphenylphosphine, an alkylaryl phosphine such as dimethylphenylphosphine and a polyfunctional phosphine such as 1,2-bis(diphenylphosphino)ethane, see column 2, lines 51+.

Hara also teaches that when succinic anhydride or succinic acid is used as the starting material, water will be formed as a byproduct, as the reaction proceeds. If the reaction is conducted while removing such byproduct water out of the reaction system by a reaction mode such as stripping, for example, by continuously circulating hydrogen in the reaction system, a further improved reaction activity can be attained. After completion of the reaction, desired 1,4-butanediol can be obtained from the reaction solution by a usual separating means such as distillation or extraction. The distillation residue can be recycled as a catalyst component to the reaction system, see column 4, line54+.

The reaction temperature is usually from 50-250 C, and when the reaction is conducted on an industrial scale, the hydrogen pressure in the reaction system is usually from 0.1 to 200 kg/cm², see column 4, lines 39+.

The difference between the process disclosed in Hara and the process covered by the rejected claims is that Hara fails to explicitly teach that about 1 mol to about 10

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mol of hydrogen are used to strip 1 mole of product from the reactor. However, given the pressure ranges of hydrogen disclosed by Hara, those of ordinary skill would expect that the claimed molar ratio of hydrogen to product would be covered by the disclosed process, and thus, prima facie obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler, can be reached at telephone number (571) 272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Karl Puttlitz/
Karl Puttlitz
Primary Examiner
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